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What Determines Financial Development in the Former Soviet Union Countries: *Remittances, Institutions, or Human Capital?*

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Declaration of Authorship

The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

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Signature

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Abstract

This paper is an attempt to find out the determinants of the financial deepening in a panel of 15 Former Soviet Union countries and Mongolia. The explanatory variables are good institutions, human capital and remittances. The main results of the model are: (1) Remittances do influence positively financial deepening in this set of data when using random effects models; (2) Human Capital has a negative impact when using fixed effects; (3) Institutions do not have any impact; (3) Russia does not behave differently than other countries in this model; (4) Natural endowments of hydrocarbon do not influence the relationships between financial deepening and the three explanatory variables in this set of countries.

JEL Classifications: I30, O15, O16, O42, O50

Keywords: Financial deepening, remittances, institutions, human capital, former soviet union region

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Acronyms

BOP	Balance of Payments
CEE	Central Eastern Europe
CIS	Commonwealth of Independent States
CPI	Consumer Price Index
EBRD	European Bank for Research and Development
EI	Education Index
EU	European Union
FDI	Foreign Direct Investment
FSU	Former Soviet Union
GDP	Gross Domestic Product
HC	Human Capital
HDI	Human Development Index
HDR	Human Development Report
HDRO	Human Development Report Office
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
IOM	International Organization for Migration
LEI	Life Expectancy Index
LLY	Liquid Liabilities
LSE	London School of Economics
M1	Short-term Money
M2	Broad Money
MTO	Money Transfer Operators
ODA	Official Development Aid
SBC	Soft Budget Constrains
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
US	United States of America
WB	World Bank
WEO	World Economic Outlook

I. Introduction

It is widely recognized by now that a sound financial sector is one of the bases for the economic growth. It is also known that, at various level of development, this relationship functions differently. For the developing countries, a strong financial system that continuously expands is much more important for the overall economic growth rate than in the developed countries.

Naturally, the attention of the economists turned than towards understanding the financial sector. A great deal of research was done towards finding out what influences the financial sector; what determines it to grow, to deepen? Using different sets of data, several empirical models were built and a number of variables were found to influence financial deepening (e.g. institutions, political climate stability, legal origins, education etc.). It is still not clear cut, however, which of these estimations are indeed important and influence financial development in all countries, in all periods. Therefore, the debate continues and the search for empirical evidence is hence reasonable and justified.

The theory suggests that the role of financial deepening in relation to the overall economic development is different for developed and developing countries. However, the data from the former soviet union (FSU) region was never used in any model that searches for determinants of the financial deepening. More so, this is a transition region where all the countries had the same start and a similar past, time wise and policy wise, in terms of financial structure. Analysing financial development in a region, group of similar countries, makes more sense, argue Detragiache et. al. (2005). While they started at the same time, with same pretty much resources, the evolution was different and only after 20 years, the differences across the region are significant.

Although FSU countries lag behind in terms of economic development, their financial systems, as an indicator for economic development, grew and

deepened in the last twenty years. The trend is not uniform across all the countries, some of them being more successful than others.

The purpose of this paper is to find the driver behind the development of the financial sector in this region. In addition to the traditional regressors, it is important to test also for institutions, human capital and remittances. In the literature, there are already discussions about the strong connection between the financial system development and institutions and human capital. Remittances are a more novel area of research for this region, a good pool of data being available only in the recent years. Remittances become an increasingly popular topic for research, being acknowledged that they represent nowadays a significant share of GDP in the FSU countries.

It is broadly recognized that financial system development is an integral part of economic development, which is a largely researched topic for the former soviet union countries. Finding out the drivers for the financial development in this region would add to the rationalization of economic development in this region.

The rest of the paper is structure as follows: (2) explains the term financial system and presents the literature review on the subject; (3) describes the economic development in the former soviet union region; (4) introduces the notion of remittances and the related literature; (5) discusses the human capital variable and the related academic findings; (6) describes the institutions variable and explain its' importance in the light of this research; (7) explains the methodology, the variables, the data and presents the results. The paper ends with a short conclusions and policy implications.

II. Determinants of Financial Deepening: Literature Review

Research on the determinants of the financial development started to be popular among the economists only in the last twenty years. It was a sequential and

a rather slow evolution of the theory. Already in 1969 Goldsmith established the relationship between a solid financial sector and the economic growth. However, Lynch (1996) and Outreville (1999) argue that the real appeal of the idea and the inspiration for further research came only after McKinnon (1973) and Show (1973) published their works where they argued about the importance of the financial sector for the economic stability.

Since then, there were few influential works that proved the existence of a direct relationship between the financial sector and the economic growth. Greenwood and Jovanovic (1990) and King and Levine (1993) developed models where they argued about the existence of this relationship. Latter, Khan and Senhadji (2007) brought evidence that proved there was a strong relationship between the economic development and the economic development. Outreville (1992) argued that there was a relationship between market structure considered a proxy of financial deepening and economic growth. There were others that wrote on the subject as well; however, there also were some that hesitated about the theory. Levine (1997) found that financial structure was unrelated to the economic growth in the developed countries. Even earlier Lucas (1990) argued that the financial sector does not play the same role in all countries; that is, in developing countries the importance of the financial sector for the economic growth is much stronger than in the rich countries. This idea is in line with the findings of Haas (2001) and Calderón and Liu (2002). Haas argued that financial intermediaries play a significant role in determining the economic growth rate in the Central and Eastern European countries through increasing marginal production and incentives to save. Calderón and Liu (2002), in trying to find the causality between the financial deepening and economic growth came to several conclusions, among them also that there is a positive relationship between the two variables and that this relationship is stronger in the developing countries than in the industrial countries.

Only after it was generally more or less agreed that there is a direct positive relationship between financial sector and economic growth, the attention of the

researchers turned towards finding the causes of different developments of the financial sector in different countries. Although relatively numerous papers were written on the subject, the evidences are not so unambiguous. Different data samples brought different results, but also different econometric techniques employed carry their dose of uncertainty. More than that, all the research so far established a correlation between the variables rather than a causality effect. Thus, Outreville (1999) uses two measures for financial deepening and finds a strong correlation with human resources (the average years of schooling of the labour force), but a small negative correlation with Romer's (1993) index of socio-political instability (SPI). He finds no relationship with other variables used in the model: inflation, real interest rate and monopoly power. Barro (1991) found that there was a strong positive relation between economic development as such and political stability and human capital (measured as the school enrolment rates) and a negative relationship with market distortions.

Merton (1992) proved that the financial system is shaped by technological development, while Bencivenga and Smith (1991) brought evidence about the impact of fiscal policies on the financial development. La Porta et. all. (1997) find a direct causality between financial development and the legal origin. They investigate a set of former colonies with different legal systems, according to the origins of the colonizers. They distinguish between four main types of legal origins – English, French, German, and Nordic – and find that colonies with Anglo-Saxon origins of the legal system have a higher financial deepening and a higher economic development level.

Girma and Shortland (2004) argue that the degree of democracy and political stability do contribute to a better financial development. Other researchers, such as Aggarwal et al. (2006), Alberola and Salvado (2006), Giuliano and Ruiz-Arranz (2006), found remittances having a significant positive impact on the financial deepening. Also remittances and good institutions were proved to influence financial deepening by Billmeier and Massa (2007), while institutions alone are found important by Singh, Kpodar and Ghura (2009) on their set of data.

Other variables that proved to influence financial deepening and that are variations of the ones mentioned already are stronger creditor rights (Acemoglu et. all. (2002), Cottarelli, Dell'Ariccia, and Vladkova-Hollar, 2003; Dehesa, Druck, and Plekhanov, 2007; McDonald and Schumacher, 2007; and Tressel and Detragiache, 2008), enforcement of contracts (Detragiache, Gupta, and Tressel, 2005; McDonald and Schumacher, 2007), poor governance (Detragiache, Gupta, and Tressel, 2005; McDonald and Schumacher, 2007), efficient exchange of information (Djankov, McLiesh, and Shleifer, 2005; McDonald and Schumacher, 2007).

A distinct set of research is dedicated to the influence of inflation on the financial deepening. A negative correlation was found by Huybens and Smith (1998, 1999), Boyd, Levine, and Smith (2001), Detragiache, Gupta, and Tressel (2005), and Dehesa, Druck, and Pleckhanov (2007).

Measuring Financial Deepening

It is commonly acceptable in the academia that there is a strong relationship between the development of the financial system and the economic growth of a country. There are several indicators that different researchers use to measure the financial sector. King and Levine (1993), for example, proposes four different indicators to measure the financial depth: (1) LLY, the traditional method that uses the size of the formal financial intermediary sector relative to economic activity; (2) BANK, that is ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets; (3) PRIVATE, this is the ratio of claims on the nonfinancial private sector to total domestic credit (excluding credit to money banks); (4) PRIVY, the ratio of claims on the nonfinancial private sector to GDP. The last two measure domestic asset distribution.

However, the simplest and the commonly accepted measure is the ration M2/GDP, which measures the degree of monetization of an economy. McKinnon

(1973) and Shaw (1973) successfully argued that financial deepening depends on real income and real interest rate. Before them, it was believed that low interest rates on bank loans and deposits encourage economic growth, an idea hold by Keynesian and neoclassical analysts. McKinon and Shaw came to argue the opposite. They argued that higher interest rates increased the amount people are willing to hold as financial assets by decreasing the holdings of non-financial assets such as cash, gold, commodities, and land (Feldman and Gang, 1990).

Different researchers propose different ways to measure the financial sector; therefore, the financial deepening. Boyd et al. (2001) propose a "refined" measure of the financial sector by capturing the relationship between the inflation rate and the growth of the financial market. However, these data is not available for the developing countries.

Liu and Woo (1994) use the ratio of long-term money or broad money (M2) to short-term money (M1). They argue that this ratio is related to the financial deepening of a country because savings increase faster than the transactions on the account balance. King and Levine (1993) suggest another proxy – the difference between broad money (M2) and narrow money (M1). Levine (1997) uses the ratio of bank credit to bank credit plus central bank assets. However, this measure cannot be accurately compiled for the development countries due to different financial systems and lack of data.

Outreville (1999) and others use M2 over GDP ratio to measure the financial deepening in the developing countries. Although, they acknowledge that this is not a perfect measure and that this ratio does not capture all the dimensions of the financial sector, it is still the closest to the true variable in the developing countries. Outreville argues that the M2/GDP ratio is rather measuring the overall size of the financial intermediation. It is also strongly correlated, argues the author, with the real GDP and the rate of exchange. The broad money M2 can be interpreted also as a measure of monetization in inflation prone countries, argues Outreville.

Haas (2001) in his paper argues that it is logically correct to use the level of financial intermediaries when measuring the financial deepening in the developing countries. He gives an example of a small business owner and his options for borrowing in a developing country. He makes the point that the business owner would have to go to for funds to financial intermediaries or to the financial market. A comparison between the two is made and Hass finds several *raison d'être* for financial intermediaries and not for the financial markets in these countries. First, the intermediaries can benefit from economies of scale, thus reducing their costs in the developing countries. Second, financial intermediaries are usually quicker and more flexible, an important attribute when working in developing countries. Third, there is a large amount of information asymmetries in the developing countries. Direct financing, through financial markets, does not solve these asymmetries as well as financial intermediaries. Thus, based on all three explanations, the financial intermediaries are better suited to be present in the developing countries.

Monetary and credit aggregates may not be an exact measure for a country's financial development (Lynch, 1996). However, it is a sufficient approximation and, most importantly, it is the most accurate data on financial sectors of the developing countries. The data is provided by the IMF statistics.

Detragiache et all (205) in their paper make a thorough syntheses of the theoretical findings about what determines financial deepening. They present a list of papers written on the subject that have contributed to the development of the theoretical background about the financial deepening:

> *"What do we know so far? A large literature has drawn on aggregate and bank-level data to uncover the determinants of financial sector development and performance in broad cross-sections of countries. Institutions (broadly defined) have been identified as a key element in financial sector performance. Institutions, in turn, have been traced back to differences in legal origin (La Porta, and others, 1998), geographical conditions at the time of colonization (Acemoglu, Johnson, and Robinson,*

> *2001), and cultural factors (Stulz and Williamson, 2003). Other studies have focused on the role of state banks (La Porta and others, 2002; Micco, Panizza, and Yañez, 2004), foreign banks (Claessens, Demirgüç-Kunt, Huizinga, 2001), and inflation (Boyd, Levine, and Smith, 2001). In addition, regulations restricting bank activities have been found to hinder financial sector performance, while those encouraging private sector monitoring of banks appear to help (Barth, Caprio, and Levine, 2004). Recent work has also uncovered that compliance with international standards of good regulation and supervision is associated with healthier banking systems (Das, Quintyn, and Chenard, 2004; Podpiera, 2004), and better creditor protection and information access increase credit to the private sector (Djankov, McLeish, and Shleifer, 2005)."* (Detragiache, Gupta and Tressel, 2005)

To conclude, there is a considerable amount of literature that is dedicated to finding the determinants of the financial deepening. The subject matter is so popular among economist because there is another set of writings that proved the existence of a direct link between overall economic development or growth and the financial deepening. While this last set of studies reviled unbendable theories, the discussion about what determines the financial deepening still continues. Here is a summary list of potential factors that were found in different set of data to have some influence on the quantity of money in an economy:

- Geographic barriers to transmit financial tools (rural-urban);
- Legal origin (English, French, German, Nordic);
- Settlers' mortality (colonial past, endowment of natural resources);
- Ethnic homogeneity;
- Political stability;

- Inflation – negative effect on foreign debt (only for relatively small cases of inflation, around 15%);
- Fiscal position (large deficits);
- Remittances;
- Bank ownership (foreign banks versus national banks, bank market concentration);
- Investments climate indicators (how easy is to invest);
- Financial sector (including banks) regulation and supervision;

As mentioned, there are still many debates among scientists about these causes of financial deepening. A firm relationship is not established, yet, by the theory. Different samples of data reveal different results. Thus, it is needed that the economists bring further empirical evidence. The literature on the subject is especially lacking evidence from the eastern Europe and central Asia.

III. Former Soviet Union Economies

After twenty years of transition, it becomes increasingly incorrect to analyse the entire former soviet union region as a whole. Although the countries have a common communist past with all it takes in terms of economy, it was never a homogeneous region. This is even more true after twenty years of discrete development, with different endowments, geopolitics and human development.

In the *Development and Transition* issue, published by UNDP and LSE, that celebrated "The Twenty Years of Transition and Human Development," (2009), the developmental economics professor *Giovanni Andrea Cornia* points out this fact. He distinguishes several episodes in the region of "tendencies" to convergence or divergence. Right after the break away of the soviet union, Cornia argues, the region differed much more in their policies and economic performance. In the mid of 1990s, a convergence towards "catching up" with the west was

registered by EBRD (although, I think this is more true for the CEE and Baltic countries than the CIS countries and Mongolia). The period after 2000 is distinguished as a new episode of registered economic growth, but at the same time, a period where the divergences between the different former soviet union countries deepened.

Using the 2006 economic development data, Cornia (2009) states that it is possible to distinguish between four clusters of former socialist countries, each with different characteristics and radically diverging from the others. Cornia lists them as follows:

1. **Countries dependent on the export of manufactured goods**, supported in most cases by large inflows of foreign direct investment and financing by foreign banks, such as the Czech Republic, Hungary, Poland, Slovenia, Slovakia, Belarus, and Ukraine.
2. **Countries with mixed and service oriented economies** (the Baltic States, Bulgaria, Romania, the Former Yugoslav Republic of Macedonia, and Georgia) with an important share of output and employment in 'other services' in the Baltics, tourism in Croatia, and informal low value-added services in the other countries.
3. **Countries that are commodities exporters** (Russia, Azerbaijan, Turkmenistan, and Kazakhstan), strongly dependent on world commodity prices and demands, and suffering to some extent from the 'Dutch disease'.
4. **Countries for which an initial dependence on official development assistance has given way to a reliance on migrant labour,** relying in this way for their growth on large and steady inflows of remittances (Albania, Armenia, Kyrgyzstan, Moldova, Tajikistan, and Uzbekistan).

The study finds that real economic growth is registered, although still small, only in the first cluster, where manufacturing was developed, all others registering downfalls in comparison. As far as the social performance goes, the findings show that only the fourth cluster registers improvements. In the others, the data analyses show downfalls (Cornia, 2009).

Mongolian economy is dependable on the export of agricultural products and mining industry (CIA, The World Factbook). The foreign investment and aid, as well as the remittances are significant for the Mongolian economy, thus the country being more similar to cluster three and four. Mongolian economic timeline displayed a similar pattern as the rest of the former soviet union republics. In 2000-2002, Mongolia experienced a deep crises due natural calamities, after which it registered a substantial economic growth, about 9% per year, up to the 2008. The global financial crises touched on Mongolian economy as well, dropping its growth to 4%. However, strong recovery is being expected in the immediate years (CIA, The World Factbook).

Nevertheless, one would think that all these countries still have something in common. Haas (2001) finds at least two similarities:

- All these countries are still quite poor overall.
- All these countries have experienced fast and radical institutional changes that have no historical precedence for the humanity. Thus, the financial system was almost non-existing. The closest to it was the banking system, which, however, was centralized. Haas argues that these were actually one huge monolithic bank with the role of only transferring funds to firms across the FSU, according to the requirement of the central planning. Lending based on risk or lending based on demand from the commercial institutions was non-existing. Savings were done through completely different structures/banks, the savings banks.

After the break-away of the soviet republics, there was a two-tire reform made in the financial/banking system (Haas, 2001). First, the commercial banks

separated from the central banks and started their activities based on the capital market principles. Second, these banks were privatized and restructured.

The process of transiting to a well functioning financial system based on capital market rules is still underway in the FSU. Although all of them started at the same point, after twenty years of development (or stagnation at times), different FSU countries are at different level of development of their financial system.

Haas (2001) argues that one should be careful to some specificities when talking or analysing the financial sector in the FSU countries. He inspires his research from the Van Ees and Garretsen (1994). They find at least three financial distortions worth bearing in mind when talking about the economies in transition:

1. There are, so called, soft budget constrains (SBC's) and no bankruptcy laws. SBC's are cases when banks and other financial institutions receive funding from the government in times of stress. SBC's exist, according to the exact definition proposed by Mitchell (2000), when: "A firm has a soft budget constraint if (1) it has negative expected net present value but receives financing; or (2) if a financial decision of a creditor or the government following default allows the firm to continue in operation although its assets would yield a greater return in an alternative use." During the transition period, these SBC's persisted for a long time in the FSU countries and called for inefficient allocation of funds at the macroeconomic level.
2. Poor conduct of the privatization process and its aftermath effects. This again, led to poor allocation of funds at the macroeconomic level.
3. The initial conditions of each country that, because of the path-dependency, influence the actions of the current economic agents.

It is also important to say that financial sector in the FSU countries remains up to nowadays rather mixed and complicated. It is still disputed whether in these

countries is better to have a bank-based system or financial market-based system. The analysts are still divided over the two models.

IV. Remittances

Remittances are the money sent by labour emigrants to their country of origin. In the literature, many times it includes also the transfers associated with moving and other financial items that might arise from this. The IMF definition of remittances, also used by Shelburne and Palacin (2007) in their paper, comprises three items on the balance of payment of a country. These are 1) workers' compensation under the income account (income earned by seasonal and short-term workers), 2) workers' remittances under the current account (income earned by migrants that stay over a year in a foreign country, and 3) transfers under the capital transfers account (capital brought by migrants when returning). The second item is by far, according to Shelburne and Palacin (2007), the largest and most important in terms of influence items. It counts for more than half of all the remittances in one country. The first component is the second by importance and the third constituting only a small part of the overall remittances. Workers' remittances, the second component, is specific, in terms that it is important for the overall income of a migrant, but it has a much smaller influence on the macroeconomic aspects of the home country[1]. Almost half of the income received by the migrants living over a year abroad remains in the foreign country, when migrants have to pay for their living (Shelburne and Palacin, 2007). The numbers vary from country to country and from one period to the other, but the pattern is more or less the same.

The definition of remittances needs to be improved overall. There are still questions about what to consider remittances and what not. For example, argue Shelburne and Palacin (2007) that it is not clear whether to consider mortgage

[1] Home country is the country receiving the remittances; foreign country is where remittances originate.

loans taken abroad as remittances. If yes, than the purpose of remittances would change dramatically – remittances will start creating future obligations.

The discussion on remittances has been intensifying in the past years, when remittances reached to represent the second largest source of external financing, after the foreign direct investment (FDI), in the developing countries. In comparison to FDI, remittances proved to be more stable flows of capital, not being affected by economic downturns and natural disaster. More so, during such crises (less during the last), remittances grow (Yang, 2006). The motivation for sending the remittances was found to be emotional (Bougha-Hagbe, 2006). Comparing to the financial aid, remittances also proved to not affect competitiveness (Rajan and Subramanian, 2005).

In the FSU region, many countries heavily rely on remittances, Tajikistan and Moldova being the most affected ones. In this region, there are several sources where remittances come from: the EU, the US, but also Russia. More so, the Moscow region and the surroundings are known to be a major source for transfers to almost all the FSU countries.

The channels for transferring the money are also an important aspect. Some transfers are made through banks and fast transfer operators, or MTOs (e.g. Western Union, Money Gram), and trough unofficial channels, such as relatives, friends, bus drivers, and train or airline operators, largely based on trust. Of course, the general interest of an economy would be to have all remittances transferred through banks. Thus personal accounts would be set and savings might increase. However people chose the unofficial means because they require less personal information disclosure than banks would do. Another explanation is that there are not sufficient banking products to suit the needs of the migrants.

The academic literature on remittances is abundant, especially in the recent years. The impact of remittances on different matters, such as poverty, education, entrepreneurial activities, and health is well documented. There are several researches that proved that remittances reduce the level of poverty (Adams, 2004

on Guatemala; Lopez-Cordova, 2005; Taylor, Mora and Adams, 2005 on Mexico). More so, it was found that rural areas in this regard, benefit the most (Maimbo and Ratcha, 2005). Empirical research proving the positive relation was done by Adams and Page (2003) that conduct an analysis of 74 countries, also by IMF in 2005 that analyses data on 101 countries.

Remittances were found to improve schooling for children (Cox and Ureta, 2003, on El Salvador; Yang, 2005, on Philippines; Hanson and Woodruff, 2003, and Lopez-Cordova, 2005, on Mexico). Remittances promote entrepreneurship (Massey and Parrado, 1998; Woodruff and Zenteno, 2001; Maimbo and Ratha, 2005; Yang, 2005) and reduce infant mortality (Kanaiaupuni and Donato, 1999; Hildebrandt and McKenzie, 2005; Duryea et. al., 2005; Lopez – Cordova, 2005).

The academic research on the effect of remittances on the economic growth is little and inconsistent, however. Chami et. al. (2003) find on a panel data of 113 countries that remittances negatively associated with the economic growth. Solimano (2003), on the contrary, finds a positive association on panel data of Andean countries. In 2005, the IMF research showed, at best, lack of correlation at the country level. The IMF's most recent paper on remittances (2009) and Barajas et. al. (2009) state that, undeniable, remittances have poverty-alleviating and consumption-smoothing effects on recipient households. But the key empirical question is whether they also serve to promote long-run economic growth. At best, both of them find no impact on economic growth.

The effects of remittances on financial deepening are not very well exploited. There are numerous descriptive papers on the subject, mainly concerned with finding ways to employ remittances as savings and investments. Among the first to explore the subject is the paper of Aggarwal et. al. (2006). They find a significant positive effect of remittances on the bank deposits and bank credit to private sector, as a prototype of financial sector development.

Another paper that study the effect of remittances, institutions and natural resources on the stock market development (as a prototype for financial deepening)

is Billmeier and Massa's, 2007. They find that remittances and institutions are significantly positive impact on market capitalization. Both of them are important.

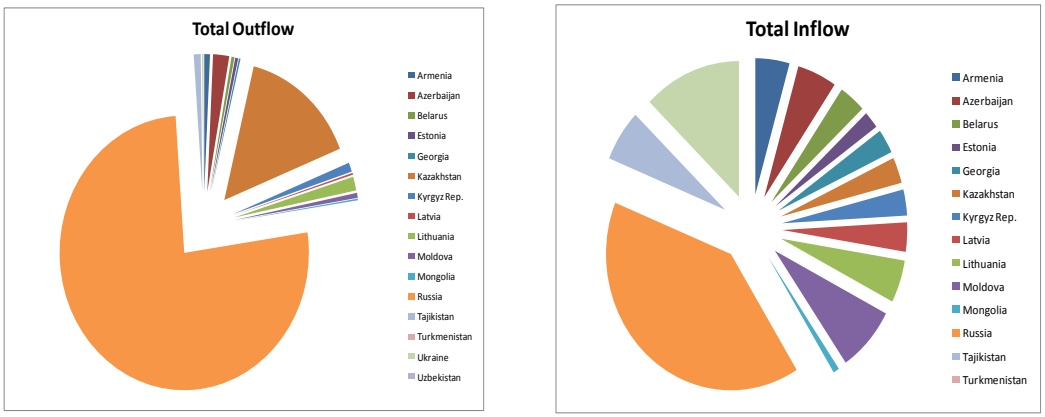
Remittances are an important source of poverty alleviation and consumer spending in the CIS countries. The phenomenon influences several economies in the region very deeply. However, the true numbers and, therefore, the true effects are hard to identify due to several reasons: (i) some countries do not report these remittances on their balance sheets; (ii) others that do, give no guarantees that their figures are absolutely true, given the unlawful specifics of remittances; (iii) often, data is poorly gathered and estimated.

Nevertheless, the WB, IOM, IMF and national governments and central banks are employing different strategies to follow the phenomenon and gather the best possible data. One of such attempts is done by Robert Shelburne Jose Palacin from UNECE in 2007. According to them, there is remittances flow from outside the region to countries in the region, but also in between the discussed former soviet union countries themselves. Thus, Russia and Kazakhstan are found to be the largest remittances outflow sources. At the same time, Russia and Moldova are found to be the destination for the largest amount of remittances compared to the national GDP.

According to the data cited by these authors, there were about USD 200 billion in 2006 (by WB estimates) transferred to the developing and transition countries (USD 300 billion in 2007, according to IFAD). The number is huge and increased rapidly in the last decade. For the FSU region and Mongolia, in the middle of 1990s the remittances constituted an insignificant percentage compared to the overall GDP. The foreign direct investment (FDI), the official developmental aid (ODA) and the private capital were the major sources of foreign capital in the region. Today, the remittances are by far the largest source of foreign revenue, being twice as large as ODA, for example. In every country in the region, the remittances are also greater than the amount of exports, thus being the major source for foreign exchange accumulation.

IFAD found that about 13% of the whole number of remittances in the world is going to the CIS countries. According to the calculations of IMF data used in this paper, the total inflow of remittances in the 16 countries is USD 101131,663 millions for the period 1992-2008. The outflow is of USD 124745,09 millions.

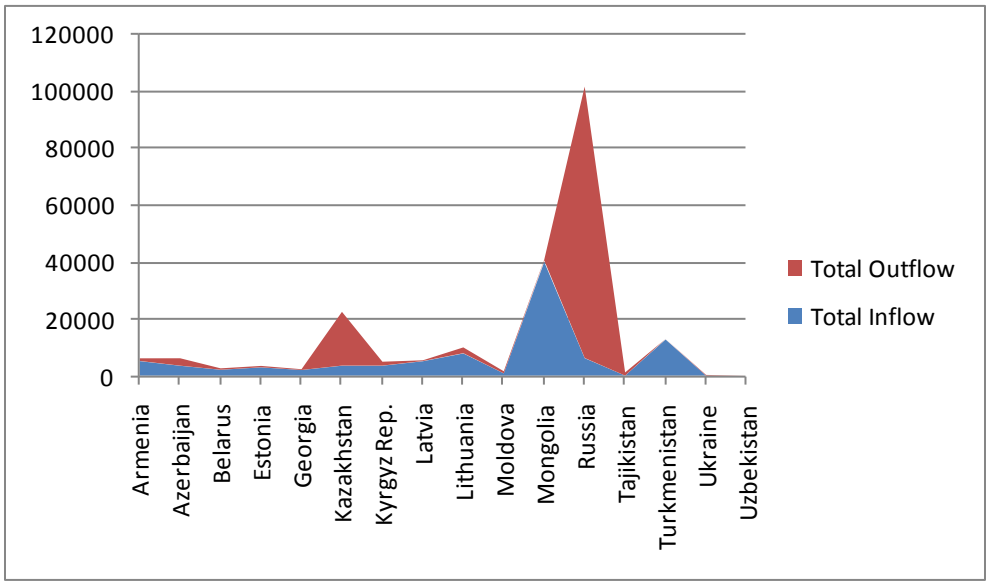
Figure 1. Remittances Outflow and Inflow in FSU, 1992-2008



Source: IMF, Author's estimations

Figure 1 shows the distribution by country of the inflows and outflows of remittances. Russia is by far a source for a large amount of remittances (USD 95165,75 millions), followed by Kazakhstan with USD 18847,59 millions. At the same time, Russia is also by far a large beneficiary from remittances. During the period of 1992-2008 a total of USD 40412,83 millions were brought in the country. Other receivers of large quantities of remittances during this period of time were Ukraine with USD 12844 millions, Moldova with USD 7873,86 millions, and Tajikistan USD 6196,867 millions. Besides Russia, Kazakhstan, and Turkmenistan all the other FSU countries were net receivers of remittances (see Figure 2).

Figure 2. Net Receivers of Remittances, 1992-2008



Source: IMF, Author's estimations

The relevant literature, as well as Shelburne and Palacin (2007) in their research argue that there are benefits coming from such a large amounts of remittances, but also there are negative effects. The line between the two is not definite, yet, empirical findings oscillating between pros and cons. Thus, it is proven that large amounts of remittances help at reducing poverty at least in the short run. The education and health services for the recipients are increasing, the remmittants also benefit from improved job skills. Because most of the emigrants are usually the highest skilled from the country, after they emigrate, there are more jobs left at home for the poor and less skilled people. However, this fact brings its negative effects as well. It can be argued that there is a brain drain occurrence, as well as incentives for the recipients at home not to work for low paid jobs. More so, the poverty alleviation effect, therefore economic growth at home, depends very much on the complementary domestic economy, argue Shelburne and Palacin

(2007). If the remittances are channelled well at home, their effect can be sustainable on the long run. Also, the composition of the emigrants (skills, education etc.) is important for how the remittances are used at home, therefore, used for poverty alleviation.

Shelburne and Palacin (2007) conclude that while the impact of remittances has positive effects at the micro-household level, not the same can be said about the macroeconomic level. In large, remittances increase at home the housing market, the construction industry develops rigorously and there is price movement is registered. However, all the macroeconomic aspects are not yet well studied and understood.

V. Human Capital

From the developmental economics, strong arguments come in favour of a positive relationship between human capital and economic growth, the direct relationship, however, between human capital and financial deepening not being explored too much.

Outreville (1999) is among the first to do it. He performs a cross-sectional analysis of 57 developing countries and finds out that human capital and socio-political stability are important factors in explaining the level of financial development. Earlier Nelson and Phelps (1966) showed that educational level along with the capital-labour ratio influence the economic development of a country and explain international trade patterns. However, the theories were not proved empirically.

Human capital is a broad and somehow difficult notion to measure. Nevertheless, the literature proposes several ways to express human capital. The most used index in the literature, a much complex one is the Human Development Index (HDI), estimated by the United Nations Development Programme (UNDP)

and published since 1990. It encompasses life expectancy, literacy rate, and access to resources sufficient for a decent standard of living. Human development is understood in this respect as "enlarging People's choice."

There are other proxies in the academia to measuring human capital. Thus, Mankiw et al. (1992) uses the average years of schooling of the labour force. Baldwin (1971) uses the percentage of educated people, having third-degree education, in the labour force. Benhabib and Spiegel (1994) propose to use a measure based on the capacity of a nation to adopt, implement and innovate new technological developments.

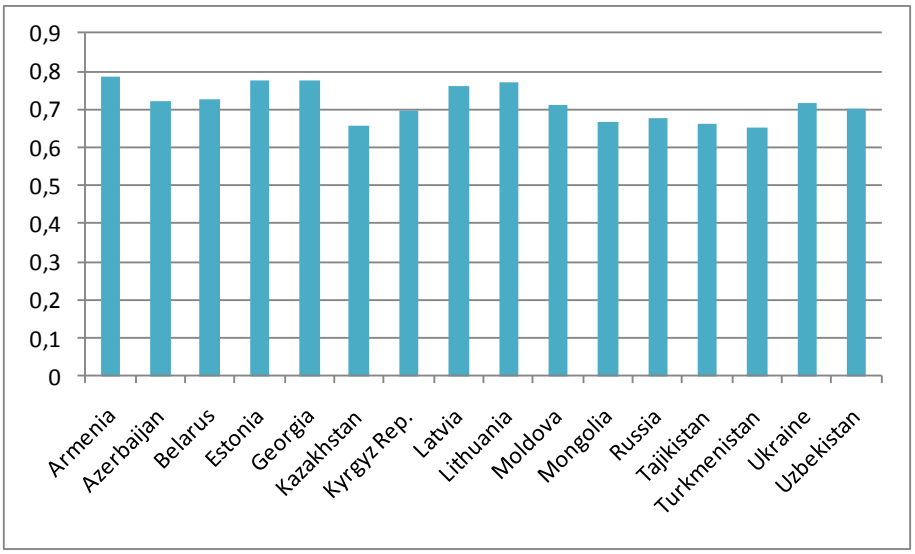
Human capital is usually understood in its broad sense. It is understood as all people having a decent life. The key components to it are understood as being an easy education access and good health system. People with higher education have access to more information and can make use of this information. Educated people are also risk averse and save more. Health services contribute again to the development without interruption. With a good health system, the endowment from generation to generation grows. Many argue, however, that human development is enlarging peoples' choices (Outreville, 1999). People themselves know what they need to improve their live in order to reach a decent standard of leaving. Their acts are determined by the limited opportunities that the environment in which they live offers them. The human development discrepancies between the different countries appear because each country offers a different set of choices, large or smaller, to its citizens.

In the former soviet union countries, the discrepancies of human development before the 1990s was much smaller than it is now. Although, there was a deep divide between countryside and cities, everybody had access to free education and health services. The level of proficiency was different in more remote regions as oppose to the city centres or important industrial zones. If comparing the FSU countries among themselves before 1990s, another discrepancy was registered between European Russia, mostly Moscow, Leningrad etc., and the rest of the other soviet republics.

Almost twenty years after the revolution in the beginning of the 1990s, the human development measure, as expressed by the UNDP's Human Development Index, is very mixed. The components of the HDI are different themselves across FSU region. For example, while the education system improved in the oil reach countries, access to education did not. The same picture is offered for the health system. In the export commodities countries, both access and quality stagnated somehow or improved insignificantly. The only group that registered some visible improvement seems to be the countries dependant of the migrant labour and of course the Baltic States. Both, health and education system rose in these countries.

Figure 3 shows the averages of human capital for each country in the sample. Armenia has overall the highest human capital in the region, 0,784 base points. It is followed by Estonia, Georgia and Lithuania, all three scoring 0,773 base points. Latvia is a step lower with 0,762 points, the lowest scoring being Turkmenistan with 0,652 points.

Figure 3. Average Human Capital, 1992-2008



Source: UNDP, Author's estimations

VI. Institutions

Considering institutions when talking about financial development and, implicitly, economic development, it is increasingly acceptable and recommended nowadays. There is a whole branch of economics, the institutional economics, that tries to analyse the effects of institutions in economy from all points of view. However, two principles are emphasised by the institutional economics: the enforcement of the property rights and the role of transaction costs (Haas, 2001). Institutional economics, according to Haas, assumes that people live according to their mental models about the society. These models differ from one group of people to another and are influenced partly by culture, partly by experiences, and partly by learning.

Institutions may be understood as rules of a game. They should not be confused with the organizations, which is a narrow way. The notion of institutions might be understood in a broader way, as the system of rules, customs and believes, and the trust people have in their written or unwritten laws. Or, it can be understood as the organizational institutions: political, economic, social, educational etc.

Haas (2001) describes institutions as made of three parts: formal rules (which are laws and regulations), informal constraints (made of conventions and self-imposed codes of conduct), and the specificities that appear when implementing the two. Once institutions appear, they will change very slowly. Although, the organizational institutions might change radically and fast, as it happened in the FSU, the broad notion of institutions will change slower, depending rather on the culture. Institutions are also "path dependent", according to Haas. They depend on the historical believes transmitted from generation to generation, but also actions done by predecessors will reflect into the present.

The legal view on the economy may be interpreted as the application of the institutional economic. Many research works have proven that the system of law influences the economic growth through the financial development system.

Investments will take place, businesses will arise only when the investors will be confident that they have the full protection against misdoings of the "insiders", which are the managers, or are sure that they can retrieve their return to investors and when they are assured that at the macroeconomic level big and radical changes will not happened unexpectedly. In short, legal economics sais that financial deepening is a better explanatory for financial growth when controlling for existence of institutions and their quality.

One might expect that the difference in institutions that developed in the FSU countries after the 1989 might affect the financial sectors. Some countries joined the EU, thus completely changing their institutions, following the EU rules; others adjusted their system of institutions or developed them from anew following different paths.

The existing literature is consistent with the idea that institutions do matter for the overall economic growth of a country. Lejour et.al. (2006) argues that EU integration brings institutional change and, therefore, contributes to the economic growth. Earlier, North (1990) proves that institutions reduce uncertainty, therefore, lowers transaction costs and contribute to economic growth. More so, Rodrik and Subraamanian (2003) claim that institutions are the unique factor explaining the economic growth. De Groot et. al. (2004) find strong relations between institutional quality and trade flows. More so, they say that the differences in institutions may impede trade among countries.

There is also research done on the effect of institutions on the financial depth directly. Billmeier and Massa (2007) prove that institutions have a significant positive effect on stock market development (used as proxy for financial deepening) in a subset of Arab and Central Asian countries.

Acemoglu et. all. (2002), Cottarelli, Dell' Ariccia and Vladkova-Hollar (2003), Dehesa, Druck, and Plekhanov (2007), McDonald and Schumacher (2007), and Tressel and Detragiache (2008), all find that stronger creditor rights promote financial development.

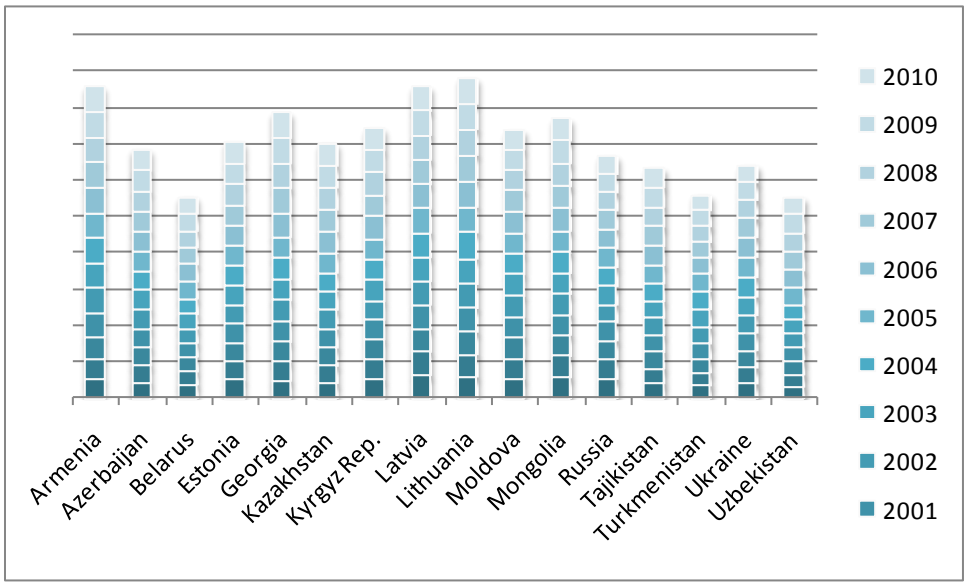
La Porta et al. (1998) proves that the legal origin (English, French, German or Nordic) is important in determining the creditor rights and private credit. Detragiache, Gupta, and Tressel (2005), as well as McDonald and Schumacher (2007) find that the degree of enforcement of rules and rights has an impact on the overall growth of the economy.

Detragiache, Gupta, and Tressel (2005), and McDonald and Schumacher (2007) stress quality of governance as a measure of institutions. They find that poor governance increases the coast of doing business. Djankov, McLiesh, and Shleifer (2005), as well as McDonald and Schumacher (2007) argue in their works that information exchange is important and it should be a proxy for measuring the quality of institutions. Good information exchange reduces the cost o screening borrowers, while the availability of credit information reduces costs.

Another way to measure the institution development is Romer's index of socio-political instability (1993). He measures political instability following Barro (1991) that is the mean number of revolutions and coups per year.

Another conventional proxy for institutions is the Heritage Foundation's Index of Economic Freedom. The index is used by many relevant papers (Lejour et. al., 2006; et. al., 2004) and in this paper. The index is composed of 10 factors with equal weights: trade policy, fiscal burden, government intervention, monetary policy, capital flows and foreign investment, banking and finance, property rights, wages and prices, regulation, black market.

Figure 4. The Heritage Foundation's Index of Economic Freedom, 2001-2010



Source: The Wall Street Journal and Heritage Foundation, Author's estimations

In the FSU region, the index varies considerably from country to country. Figure 4 illustrates the evolution of the index across the region during the period 2001-2010 for which the data is complete for all countries. The highest overall index belongs to Lithuania, followed by Armenia and Latvia. The lowest scoring countries are Belarus and Turkmenistan.

VII. What Drives Financial Deepening in the FSU Countries?

A. Variables and Assumptions

Financial Deepening is a measure of the quantity of broad money in an economy as a percentage of the GDP. A special formula is proposed by Calderón and Liu (2002):

$$\frac{M2}{GDP} = \frac{\frac{1}{2} \times \left[\frac{M2_t}{CPI_t} + \frac{M2_{t-1}}{CPI_{t-1}}\right]}{GDP_t}$$, where

M2 is the Broad Money Liabilities (line 35L) from the International Financial Statistics (IFS) assembled by the International Monetary Fund (IMF). It is the sum of the Currency Outside Depository Corporations (line 34a) and the lines 14d, 15, 16a, 24, 25, and 26a (IMF, 2010). It represents the percentage change over the last year and "when there is more than one version or definition of broad money (money plus quasi money for non-SRF countries) and monetary base (reserve money for non-SRF countries) over time, different time series are chained through a ratio splicing technique. When actual stock data needed for the growth rate calculation are missing, no percent change is shown in the world table." (IFS, 2010)

CPI is Consumer Price Index (line 64..XZF…) from IFS and it shows the percentage change over the last period. It is commonly used as an indicator of inflation and it "reflect changes in the cost of acquiring a fixed basket of goods and services by the average consumer" (IFS, 2010). The Laspeyres formula is used and the data is taken from household expenditure surveys conducted by the national governments.

GDP is real, taken from the IMF World Economic Outlook (WEO) where it is measured in national currency. For the purpose of this model, the GDP is transformed in U.S. Dollars. The exchange rate is the *rf* series from the IFS and it indicates the average rate for the period.

This formula, argue Calderón and Liu (2002), is a better measure of the financial deepening than others used in the literature because it solves for two problems: the stock-flow problem and the inflation problem. The items

representing the financial intermediaries are measured at the end of each period, but the real GDP is computed over the year. Calderón and Liu (2002) and, earlier, King and Levine (1993a) have solved for this problem by taking the average over two consecutive periods and dividing it by the GDP of the last one.

The excessive inflation impact on the financial deepening is solved by deflating the Broad Money at the end of each period by the CPI at the end of each period. This technique was proposed by Levine et. all. (2000) and later used by Calderón and Liu (2002) and others.

There are other measures of the financial deepening used in the literature, such as the ration of the credit provided by the financial intermediaries to the private sector over GDP (Calderón and Liu, 2002) or the stock market development (Billmeier and Massa, 2007). However, for this sample of countries, the data is limited. The most accurately calculated variable remains the one that is used in this model.

Remittances are the ratio of the net sum of three accounts from the IMF's Balance of Payments (BOP) statistics and the GDP. Shelburne and Palacin (2007) argue that the common and the most appropriate way to count for all the remittances in a country is to add three BOP accounts:

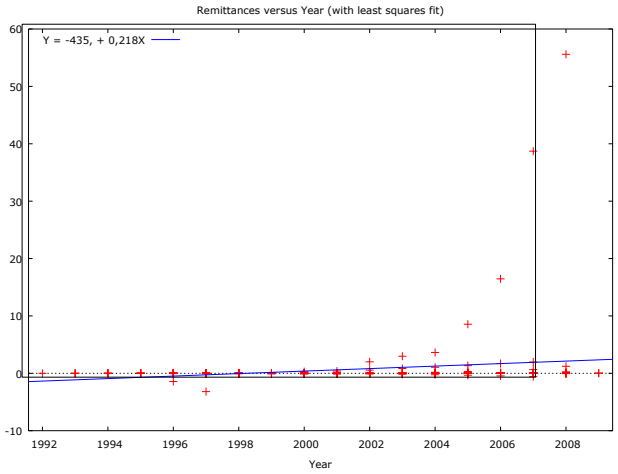
- Transfers from migrants, residents abroad for over a year. These are repatriation of financial assets when migrants return home (net of BOP code 2431 credit and 3431 debit);
- Compensation of seasonal or short-term workers (net of BOP code 2310 credit and 3310 debit);
- Remittances of migrants, residents abroad for over a year (net of BOP 2391 credit and 3391 debit).

In the context of this model, the net remittances thus calculated are expressed as a share of GDP. Aggarwal et all. (2006) in their model use remittances and the financial deepening variables in the same, as a share of GDP, and they find no correlation of residuals of the two variables. Because the GDP data is given in

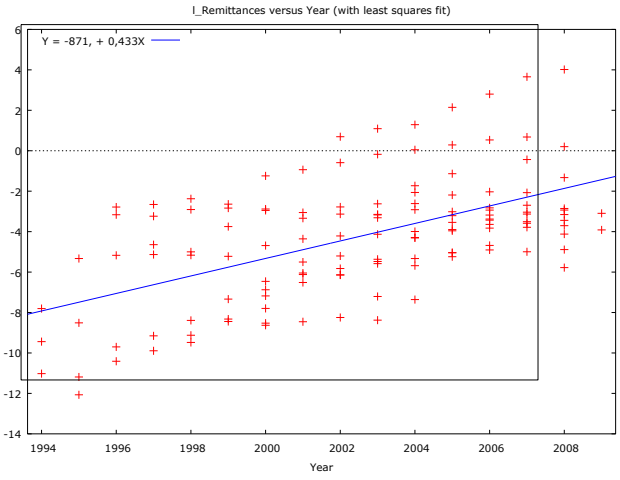
billions of national currency, the necessary transformations are made. Also, this variable is logged because the variations of it are big (see figures bellow) and it will return an extremely large constant.

Figure 5. Distribution of Remittances

PLAIN DATA



LOGGED DATA



Source: Author's estimations

The difference the logged *remittances* variable brings can be seen in the models bellow. The models are identical with the exception that in the first one the logged variable is used. The constant coefficient changes only.

Table 1. Distribution of Remittances

	Model 1:Random-effects (GLS)	Model 7:Random-effects (GLS)
HC	0.45989 (-0.7417)	0.60372 (-0.5201)
Institutions	0.80463 (-0.2480)	0.42557 (0.7989)
Remittances		0.07429* (1.7972)
Log Remittances	0.05104* (1.9733)	

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

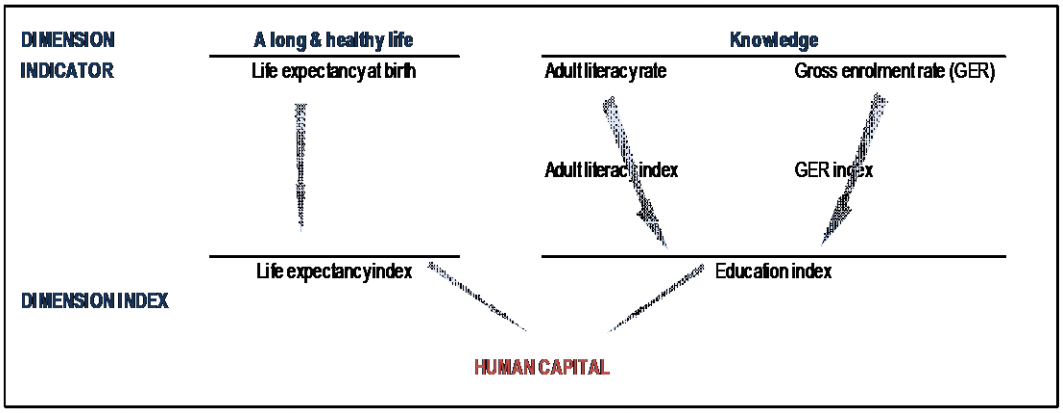
Human Capital is a prototype of the Human Development Index (HDI) calculated by the United Nation Development Programme (UNDP). While some scientists argue that the HDI is an appropriate tool in measuring human capital, the index would cause endogeneity problems if used in this model. The HDI is a composite of three variables, life expectancy index, education index and income expressed as GDP (HDR Technical Note 1). A loop of causality would have been caused between the explanatory variable and the dependent variable which is M2/GDP.

In the literature, however, both education and life expectancy are used to measure the human capital; therefore, it is considered appropriate to use only the two components of the HDI in this model, that is, life expectancy (LEI) and

education indexes (EI). The new HC index is the average of the two dimensions used to calculate the HDI. The diagram below illustrates in details the process of calculating these two indexes.

The UNDP's Human Development Report Office (HDRO) provides the data for the last two consecutive years (2006 and 2007). For the previous ones, the data and the HDI index are given as averages of 5 years (e.g. 1991-1995, 1996-2000 etc). It is argued that the HDRO is not a statistical gathering office; they rather use the data from other UN agencies, such as IMF, WB and UNCTAD that keep and publicize their complete databases. The EI and LEI are very complicated and time-consuming to be computed; therefore, the EI and LEI in this paper have same average value for five consecutive years for the period 1992-2005. This modus operandi does not allow to accurately seize the time-effect of the human capital variable on financial deepening; however, it is still accurate enough to predict the overall relationship between the explanatory and explained variables.

Figure 6. Human Capital: two components

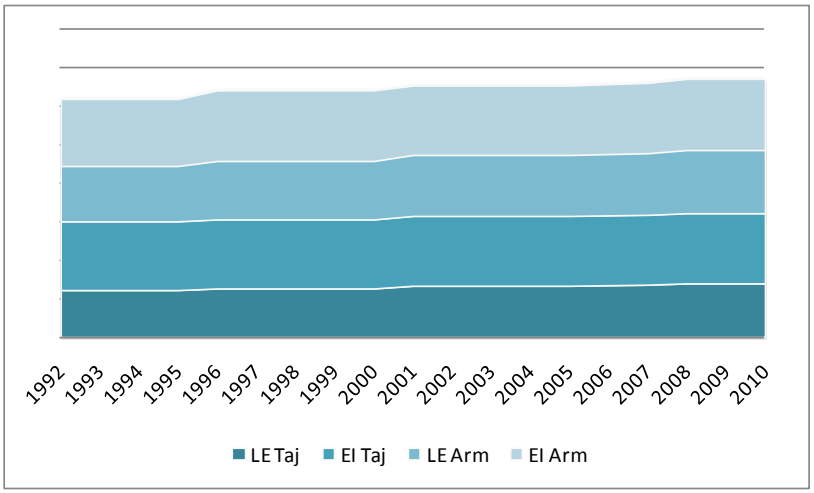


Source: Human Development Report 2007/2008, Technical Note 1

The zeroes indicate that there is not data available. In this case the formula calculates the HC based on one variable only. For the years 2008, 2009 and 2010 the data is extrapolated. The average growth rate for the entire period is found and

it is added to the value of 2007. The resulting value is used for all the last three years in order to be consistent with the technique used for this variable. The figure bellow shows the smooth and consistent growth path of this value across the years. Because the extrapolation is done for a short time period, there are no reasons to suspect major deviations in the results.

Figure 7. LE and EI for Armenia and Tajikistan



Source: UNDP, Author's calculations

Institutions variable is The Wall Street Journal and The Heritage Foundation's Index of Economic Freedom. The index is the average of ten components of economic freedom: business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, and labor freedom. Each of the ten variables are grade on a scale from 0 to 100, the highest having 100 points. The overall economic freedom index if then calculated as the average of the ten "freedoms."

Hydrocarbon net exporters dummy is used for the four net exporting countries in the FSU group. It is believed that natural resource endowments do have an important impact on the quantity of money. This dummy is used to verify

once again this hypothesis. The FSU hydrocarbon net exporting countries are listed in the table below.

Table 2. Hydrocarbon Net Exporting FSU Countries

Rank	Country	Thousand barrels per day
1	Russia	6874
2	Kazakhstan	1185
3	Azerbaijan	754
4	Turkmenistan	86

Source: U.S. Energy Information Administration: Country Energy Profile, 2008

Other variables are used in the literature to explain the financial deepening; however, their importance is still disputed. Therefore, they are not included in this model. For general information, here is a short list:

Income has been found by Billmeier and Massa (2007) to be linked to the quality of institutions and the business cycle mechanics, thus influencing the stock market capitalization and, therefore, the quantity of money.

Inflation change is usually used as a macroeconomic stability indicator and it is commonly believed that it influences the financial intermediation sector. However, we control for it when computing the M2/GDP formula.

Domestic credit indicates the level of financial intermediary development by evaluating the long-term credits provided by the banks.

One more reason for why this model do not uses other explanatory variables and it is kept as simple as possible is that the sample of observations is quite small and more variables would reduce the degrees of freedom in the model.

B. The Data

M2: The earliest data on Broad Money that IMF provides is only for two countries, Moldova and Estonia, starting in 1992. Starting with 1995 onwards, there is data for almost all of the countries. For Tajikistan the records start in the year 1999 and for Mongolia in 2002. Turkmenistan and Uzbekistan do not provide this type of data, due to the differences in the definition and the measure of this variable. No data is published for 2010, yet.

CPI: The records are slightly better for this variable; starting with 1994 almost all of the countries in the sample having the data, except the Kyrgyz Republic for which it starts in 1995. For Turkmenistan and Uzbekistan no such index is computed. No data is published for 2010, yet.

GDP: IMF started computing this variable for the FSU countries only in 1992. For Estonia, the GDP is published starting with 1993, and for Georgia starting with 1994. The figures for 2010 are predicted.

Exchange Rates: The data exists for almost the entire period for all the FSU countries. There are few gaps and for Turkmenistan the average exchange rate per annum is calculated only up to 2002. However, these gaps do not reduce the quantity of the data of the other variables.

Remittances: IMF improved considerably their method of calculating remittances with high precision and it reports them diligently across the period for all the FSU countries. The data for the last two years, 2009 and 2010 is missing, however, for almost all countries. Also, at the beginning of the '90s some data is missing mostly because there were no such transfers registered, yet, in the FSU region.

Institutions: The index was put together in 1995. Thus, most of the FSU countries have it calculated since 1995-1996. The FSU Asian countries have it calculated since 1998: Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

C. Methodology

The analysis uses a panel data from 15 former soviet union countries and Mongolia for the period 1993-2008. The following regression is run:

$$y_{it} = B_0 + \beta_1 Remittances_{it} + \beta_2 Human\ Capital_{it} + \beta_3 Institutions_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

where the dependent variable is the *financial deepening*, calculated as the ratio of broad money (M2), adjusted for inflation, and GDP. This method of measuring financial deepening is consistent with the literature and the most accurate for the sample of former soviet union countries. The explanatory variables are *remittances, human capital* and *institutions.* The error term is decomposed in a constant (α_i) and the residual.

The models verify whether the remittances, human capital and institutions do have an effect on the financial deepening. The null hypothesis states that the coefficients of these three variables are zeros. In other words, there is no correlation between the three independent variables and the dependent. The alternative hypothesis confirms the existence of a relationship between the financial deepening and the three variables.

In order to decide whether a fixed effect or a random effect model should be used, a Hausman test is usually conducted on the data to prove or reject the hypotheses that the individual effects are uncorrelated to other regressors. The *gretl* programme automatically performs the fixed effect panel model; therefore, when performing the random effect model, the programme automatically publishes the Hausman test[2]. Both models are presented below, the fixed effect and the random effect with the Hausman test included.

[2] Gretl User's Guide, 2009: "When you estimate using random effects, the Breusch–Pagan and Hausman tests are presented automatically […]The Hausman test probes the consistency of the GLS estimates. The null

Table 3. Fixed-effects model

Dependent variable: M2_GDP Robust (HAC) standard errors				
	coefficient	**std. error**	**t-ratio**	**p-value**
Const	9.05521	3.37691	2.6815	0.00863***
L_Rem	0.235375	0.197017	1.1947	0.23515
HC	-8.02078	3.86659	-2.0744	0.04072**
Inst	0.00659708	0.0321365	0.2053	0.83779
Mean dependent var 1.697652 Sum squared resid 1229.763 R-squared 0.361358				

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

The null hypothesis for the Hausman test is that the group-specific error is not so correlated and, therefore, the random effects model is preferable. A low p-value for this test counts against the random effects model and in favor of fixed effects.

$$H_0: E(\alpha_i/\chi_{it}) = 0$$

$$H_A: E(\alpha_i/\chi_{it}) \neq 0$$

In this model, the test returns a relatively high p-value (0.291848) and the Chi-square (3.7324) with three degrees of freedom is much lower than the critical

hypothesis is that these estimates are consistent — that is, that the requirement of orthogonality of the vi and the Xi is satisfied. The test is based on a measure, H, of the "distance" between the fixed-effects and random-effects estimates, constructed such that under the null it follows theχ2 distribution with degrees of freedom equal to the number of time-varying regressors in the matrix. If the value of H is "large" this suggests that the random effects estimator is not consistent and the fixed-effects model is preferable."

value (7.81473). Thus, the null hypothesis is not rejected and the random effect model is preferred for this pool of data.

Table 4. Random-effects (GLS) model and Hausman

Dependent variable: M2_GDP				
	Coefficient	**std. error**	**t-ratio**	**p-value**
Const	9.79948	7.60777	1.2881	0.20049
L_Rem	0.489364	0.247992	1.9733	0.05104*
HC	-5.68507	7.66486	-0.7417	0.45989
Inst	-0.0167042	0.0673618	-0.2480	0.80463
Hausman test Null hypothesis: GLS estimates are consistent Chi-square(3) = 3.7324 p-value = 0.291848				

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

While many econometricians do rely on the Hausman test in deciding which model is better suited for a set of data, other advice to take in consideration different factors about the data (see Mátyás and Sevestre, 1996; Hsiao, 1986; Mundlak, 1978). The way the data is built is important when deciding which model is be more appropriate. Thus, Mátyás and Severstre (1996) list in their book several characteristics of the sample that should be checked:

- *The underlying causes.* If it is suspected that the individual effect (α_i) depends on many unobservable variables randomly chosen, than the random effect model is recommended to be used.

- *The nature of the sample.* When the sample is small and it is believed that the sample units have something in common, the fixed effect method is preferable. This is the case of the present model.
- *The type of inference.* Both methods can be used, but attention should be paid to the interpretation. When using the random effect model, we check whether there is an individual effect that varies for each country. Within a fixed effect model we want to show that there exists some effect that is constant for all countries.
- *Number of variables.* The random effect model can be used only when the number of cross-section units is much larger than the number of parameters that need to be estimated.

Using one or another model is a tradeoff between efficiency and consistency. When performing the random effect model, more information between the units of the data is preserved than in the random effect model. The estimates are efficient and consistent. However, there is not anymore consistency when the unit specific component is correlated with the repressors.

In this model, the Hausman test indicates to use the random effect approach, but the sample is quite small and closed and it is suspected that the unit specific effect is constant. Therefore, both models will be performed and the results adequately interpreted and compared.

Another test that needs to be done is the "poolability test" or the "Chow test" which verifies the stability of the repressors across all 16 countries or across 19 time periods. The idea behind it is that the sample is divided into two groups and it is verified whether the coefficients for one group are equal to the coefficients of the other. In other words, the behavior of coefficients is tested. If it is the same, the data can be "pooled", that is, one equation can be used for all countries across all periods.

$$H_0: \beta_i = \beta \; for \; all \; i \; 0$$

$$H_A: \beta_i \neq \beta \; for \; at \; least \; one \; i$$

In *gretl*, the Chow test needs to be performed after the pooled OLS model. The results are shown in the table below. The p-value is quite large and the null hypothesis cannot be rejected. Thus, the sample is "poolable" and the error-component models can be performed on the data.

Table 5. Poolability of the data

Pooled OLS
Dependent variable: M2_GDP
Robust (HAC) standard errors

	Coefficient	std. error	t-ratio	p-value
Const	14.5984	6.29836	2.3178	0.02236**
L_Rem	0.685123	0.20115	3.4060	0.00093***
HC	-9.75961	6.52446	-1.4958	0.13764
Inst	-0.0319135	0.0256481	-1.2443	0.21611

Chow test
for structural difference with respect to du_8 –

Null hypothesis: no structural difference
Test statistic: F(4, 103) = 0.141282
p-value = P(F(4, 103) > 0.141282) = 0.966443

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

Because the sample is small and because the data for the human capital variable is averaged, all other different tests will not tell much. However, few other manipulations with the model are performed. First, Russia is removed from the sample and than a dummy is introduced for the hydrocarbon net exporting countries.

The outlier Russia: Inheritor of the legacy of the former Soviet Union and the largest country in the FSU group, Russian economy might be radically different from the others in the sample. This suspicion is even more valid when taking in consideration the vast migration to the Moscow region from the other FSU countries and the large amounts of remittances sent from the Moscow regions to the other countries. Therefore, we want to control for Russia and see how much it influences, if at all, the overall results of the model. Let R be the dummy for Russia, then:

$$y_{it} = B_0 + (\beta_1 + \gamma_1 R)Remittances_{it} + (\beta_2 + \gamma_2 R)Human\ Capital_{it} \quad (2)$$
$$+(\beta_3 + \gamma_3 R)Institutions_{it} + \alpha_i + \varepsilon_{it}$$

The null hypothesis states that Russia does not influence significantly the financial deepening, whereas the alternative hypothesis states that is considerably influencing the results, and therefore an outlier. In other words, we want to check whether the impact of remittances, human capital and institutions on the financial deepening in Russia is the same as in the entire sample.

$$H_0: \gamma_1 = \gamma_2 = \gamma_3 = 0$$

$$H_A: \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq 0$$

The results of the models, fixed effect and random effect, are presented in the table below. The null hypothesis can be rejected in the fixed effect model for remittances and institutions, but not for the human capital. The dummy for Russia shows perfect colliniarity and, therefore, it is omitted. In the random effect model, the null hypothesis is rejected only for remittances. In all these cases, the results are showing that there is a relationship (the coefficients are not zero) between the independent variables and the quantity of money in an economy. More so, the

results are comparable with the results of the full sample. It can be concluded that Russia is not much more different from the other countries in the sample.

Table 6. RE and FE on the sample without Russia

	FE: no Russia	RE: no Russia
L_Rem	0,23515 (1,1947)	0.06647* (1.8544)
HC	0,04072** (-2,0744)	0.11537 (-1.5876)
Inst	0,83779 (0,2053)	0.90408 (0.1208)
Russia dummy	n.a.	0.16419 (-1.4008)

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

Hydrocarbon net exporters: In the FSU group of countries, the largest and most important endowment of natural resources is the petroleum. The countries in our sample owning petroleum and exporting hydrocarbon products are four. Suppose that the group of hydrocarbon net exporters is H; than the equation of the model looks like:

$$y_{it} = B_0 + (\beta_1 + \gamma_1 H)Remittances_{it} + (\beta_2 + \gamma_2 H)Human\ Capital_{it} + (\beta_3 + \gamma_3 H)Institutions_{it} + \alpha_i + \varepsilon_{it} \quad (3)$$

The null hypotheses states that being a hydrocarbon net exporting country does not affect the overall impact of the three variables on the financial deepening,

whereas the alternative hypothesis states that it does make a difference. In other words, we verify if the natural resource endowments do have an impact on the quantity of money in an economy.

$$H_0: \gamma_1 = \gamma_2 = \gamma_3 = 0$$

$$H_A: \gamma_1 \neq \gamma_2 \neq \gamma_3 \neq 0$$

The results are presented in the table below for the fixed effect and random effect models.

Table 7. RE and FE controlling for oil net exporters

	FE: oil	RE: oil
L_Rem	0.23515 (1.1947)	0.07645* (1.7893)
HC	0.04072** (-2.0744)	0.12888 (-1.5306)
Inst	0.83779 (0.2053)	0.92457 (0.0949)
Oil dummy 1	n.a.	0.17286 (-1.3724)
Oil dummy 2	n.a.	0.57390 (-0.5641)

Source: Author's estimations

Note: The coefficients with the t-ratio in parenthesis are presented.

The dummy variable in the fixed effect approach exhibits perfect collinearity; therefore, the results are biased and cannot be interpreted. The random effect model, however, is alright and it indicates that when controlling for hydrocarbon net exporting economies, remittances remain as important as before. But the dummy for oil exporting countries is statistically insignificant, although it influences negatively the financial deepening in an economy. The t-ratio for this

dummy is negative and large which indicates that the sample for this variable is too small and the extremes are too large. The dummy for two other net exporters (Kazakhstan and Turkmenistan) are not included because of insufficient data.

D. Panel Regression Results

The table bellow summarizes the result for all the models. There is a difference in results when considering the fixed effect or the random effects models; however, usually not very large. The most noticeable discrepancy is for the *remittances* variable which proves to be significantly influencing the financial deepening in the FSU economies when running a random model and not at all when performing the fixed effect model. It may be concluded that there is dependence between remittances and the quantity of money in a specific form for each country considered separately. The assertion is in line with the fact that in some FSU economies remittances are very large, surpassing several times the national budgets.

Human Capital also exhibits different levels of significance for each type of model. It becomes statistically significant in the fixed effect models and reveals a negative effect on the financial deepening in the sample. While from the technical point of view it can be stated that there is some negative effect that is constant across all countries for the entire period, a more reasonable explanation would be that the sample is too small for this variable and the extremes are too large. The high negative t-ratio confirms it.

In the models (3) and (4) Russia is taken as an outlier. The results in terms of statistical significance are not very different from the results in the models (1) and (2). All three variables display a similar pattern, except the *institution* variable, which is not significant, however. The results can be interpreted as showing that Russia is not so much different than the other countries in the sample, as one would suspect. At least, not in terms of what influences the financial deepening.

Table 8. Panel Regression Results

	RE	FE	RE no Russia	FE no Russia	RE no oil	FE no oil	no log Rem
	(1)	(2)	(4)	(3)	(5)	(6)	(7)
Remittances	0.05104*	0.23515	0.06647*	0,23515	0.07645*	0.23515	0.07429*
	(1.9733)	(1.1947)	(1.8544)	(1,1947)	(1.7893)	(1.1947)	(1.7972)
Human Capital	0.45989	0.04072**	0.11537	0,04072**	0.12888	0.04072**	0.60372
	(-0.7417)	(-2.0744)	(-1.5876)	(-2,0744)	(-1.5306)	(-2.0744)	(-0.5201)
Institutions	0.80463	0.83779	0.90408	0.83779	0.92457	0.83779	0.42557
	(-0.2480)	(0.2053)	(0.1208)	(0.2053)	(0.0949)	(0.2053)	(0.7989)
Observations	111	111	111	111	111	111	156
Number of Countries	12	12	12	12	12	12	13

Source: Author's estimations

Note: Financial deepening (M2/GDP) is the dependent variable. The coefficients with the t-ratio in parenthesis are presented. The panel is balanced.

From the three variables, again *remittances* have the highest positive impact and *human capital* the highest negative impact.

Nor does it matter if the countries are net-exporters of hydrocarbon products. The models (5) and (6) are similar to (1) and (2) in terms of statistical significance of the variables. Here too *remittances* remain to have positively influenced the most the financial deepening in the sample and the *human capital* negatively.

To conclude, in all models *remittances* proved to be important in determining the financial deepening in the former soviet region. This variable remains significant even when we control for Russia, a major source for remittances to the other countries in the sample. The relationship between the remittances and the quantity of money in an economy remains noteworthy in both hydrocarbon exporting and non-exporting economies. The *human capital* is negatively related to the financial deepening in sample in all models; however, this might be caused by the limited data. *Institutions* do not influence the quantity of money in the economies of the former soviet union countries.

VIII. Conclusions and Policy Implications

Financial deepening is essential for the economic growth in a country. This paper is an attempt to explain the influence of remittances, institutions and human capital on the financial development. The model uses a panel data on 15 former soviet union countries and Mongolia for a period of nineteen years (1992-2010).

The main results show that remittances do influence positively financial deepening in this set of data when using random effects models, while human capital has a negative impact when using fixed effects. It is suspected, however, that this last conclusion is rather arguable because the extremes of the sample are too large. It was also found that institutions do not have any impact on the

financial deepening. Also Russia does not behave differently than other countries in this model, nor do countries which posse natural endowments, such as hydrocarbon. In all cases remittances remain to be the most influential variable.

Thus, it can be inferred that remittances do improve living conditions, but also increase private savings. This conclusion is in line with the findings of Billmeier and Massa (2007). Governments should continue to facilitate this sort of transfers, but also put additional efforts into encouraging individuals to invest these resources in long-term sustainable projects. Also, the banking sector has to become more competitive in providing services to migrants. This would reduce the high tariffs that migrants have to pay to the money transfer operators (MTOs) and would reduce the high risk by using other informal transfers. Transferring through banks would further provide incentives to save and invest in the long-term.

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Appendix A: List of Countries

1. Armenia
2. Azerbaijan
3. Belarus
4. Estonia
5. Georgia
6. Kazakhstan
7. Kyrgyz Republic
8. Latvia
9. Lithuania
10. Moldova
11. Mongolia
12. Russia
13. Tajikistan
14. Turkmenistan
15. Ukraine
16. Uzbekistan

Appendix B: Data Source

CPI	International Monetary Fund, Balance of Payments
GDP	International Monetary Fund, Balance of Payments
Human Capital	United Nations Development Programme, Human Development Index
Hydrocarbon net exporters	U.S. Energy Information Administration: Country Energy Profile
Institutions	The Wall Street Journal and The Heritage Foundation's Index
M2	International Monetary Fund, Balance of Payments
Remittances	International Monetary Fund, Balance of Payments

Appendix C: Data Set

Country	Year	M2/GDP	Remittances	HC	Institutions
Armenia	1992	n.a.	n.a.	0,797463431	n.a.
Armenia	1993	n.a.	n.a.	0,797463431	n.a.
Armenia	1994	n.a.	n.a.	0,797463431	n.a.
Armenia	1995	0,019724012	0,004847433	0,797463431	n.a.
Armenia	1996	0,708280837	0,042223121	0,840654185	42,20
Armenia	1997	0,145909556	0,00961616	0,840654185	46,70
Armenia	1998	0,238621891	0,00673051	0,840654185	49,60
Armenia	1999	9,188965019	0,058659223	0,840654185	56,40
Armenia	2000	-9,219320522	0,056116019	0,840654185	63,00
Armenia	2001	-15,10372685	0,047079071	0,849164192	66,40
Armenia	2002	9,707150064	0,062126097	0,849164192	68,00
Armenia	2003	8,805798703	0,072408119	0,849164192	67,30
Armenia	2004	1,157454035	0,127169319	0,849164192	70,30
Armenia	2005	7,524844172	0,111945838	0,849164192	69,80
Armenia	2006	7,108680994	0,131083586	0,854471067	70,60
Armenia	2007	1,972013238	0,125954614	0,859468872	68,60
Armenia	2008	0,091267937	0,016207045	0,874970233	69,80
Armenia	2009	0,553163254	n.a.	0,874970233	69,90
Armenia	2010	n.a.	n.a.	0,874970233	69,20
Azerbaijan	1992	n.a.	n.a.	0,336316667	n.a.
Azerbaijan	1993	n.a.	n.a.	0,336316667	n.a.
Azerbaijan	1994	0,047802331	n.a.	0,336316667	n.a.
Azerbaijan	1995	0,080611846	-0,001388782	0,336316667	n.a.
Azerbaijan	1996	0,096535783	-0,003116474	0,351141667	30,00
Azerbaijan	1997	1,082014025	-0,003391774	0,351141667	34,00
Azerbaijan	1998	2,684174413	-0,003908611	0,351141667	43,10
Azerbaijan	1999	1,503364231	-0,003513379	0,351141667	47,40
Azerbaijan	2000	2,952740015	-0,006981211	0,351141667	49,80
Azerbaijan	2001	2,509498474	-0,005878257	0,810332295	50,30
Azerbaijan	2002	-0,156280391	-0,007960955	0,810332295	53,30
Azerbaijan	2003	1,293512257	0,000229905	0,810332295	54,10
Azerbaijan	2004	1,292943426	0,003403307	0,810332295	53,40
Azerbaijan	2005	0,423557222	0,040345402	0,810332295	54,40
Azerbaijan	2006	0,41266026	0,034148697	0,813173962	53,20
Azerbaijan	2007	0,378267065	0,043680901	0,815748962	54,60
Azerbaijan	2008	0,11339123	0,042607271	0,935607036	55,40
Azerbaijan	2009	0,012660223	n.a.	0,935607036	58,00
Azerbaijan	2010	n.a.	n.a.	0,935607036	58,80
Belarus	1992	n.a.	n.a.	0,822719243	n.a.

Belarus	1993	n.a.	n.a.	0,822719243	n.a.
Belarus	1994	n.a.	n.a.	0,822719243	n.a.
Belarus	1995	n.a.	5,73178E-06	0,822719243	40,40
Belarus	1996	0,000715007	6,12639E-05	0,835242343	38,70
Belarus	1997	0,003703681	0,00010579	0,835242343	39,80
Belarus	1998	0,022158765	0,000227256	0,835242343	38,00
Belarus	1999	0,688376686	0,000650946	0,835242343	35,40
Belarus	2000	-0,702649409	0,001563765	0,835242343	41,30
Belarus	2001	-0,377144738	0,000212415	0,842057904	38,00
Belarus	2002	0,119222304	0,000262103	0,842057904	39,00
Belarus	2003	0,13603295	0,000741383	0,842057904	39,70
Belarus	2004	0,033415234	0,000636914	0,842057904	43,10
Belarus	2005	1,201352029	0,005299554	0,842057904	46,70
Belarus	2006	1,187921146	0,007403455	0,844379806	47,50
Belarus	2007	0,312609657	0,006763827	0,847307011	47,00
Belarus	2008	0,150023569	0,007536128	0,853453953	45,30
Belarus	2009	0,17167049	n.a.	0,853453953	45,00
Belarus	2010	n.a.	n.a.	0,853453953	48,70
Estonia	1992	n.a.	n.a.	0,825834108	n.a.
Estonia	1993	n.a.	-3,44795E-05	0,825834108	n.a.
Estonia	1994	0,105981011	0,000408157	0,825834108	n.a.
Estonia	1995	0,130957177	-0,000362464	0,825834108	48,05
Estonia	1996	0,214518681	-8,53191E-05	0,855607864	48,74
Estonia	1997	0,435649713	-0,000478482	0,855607864	49,44
Estonia	1998	0,342629295	-8,53921E-05	0,855607864	50,14
Estonia	1999	0,64595591	-0,000174847	0,855607864	50,84
Estonia	2000	1,196191992	0,000178524	0,855607864	51,54
Estonia	2001	0,876508355	0,001481584	0,877609473	52,24
Estonia	2002	0,530365154	0,002137144	0,877609473	52,94
Estonia	2003	0,648159352	0,003762548	0,877609473	53,64
Estonia	2004	0,649344835	0,013709739	0,877609473	54,34
Estonia	2005	0,685695064	0,019048541	0,877609473	55,04
Estonia	2006	0,661551077	0,026215896	0,878809251	55,74
Estonia	2007	0,286294939	0,022696916	0,881475918	56,44
Estonia	2008	0,013931967	0,003094853	0,89538637	57,14
Estonia	2009	n.a.	0,019927058	0,89538637	57,84
Estonia	2010	n.a.	n.a.	0,89538637	58,54
Georgia	1992	n.a.	n.a.	0,3814	n.a.
Georgia	1993	n.a.	n.a.	0,3814	n.a.
Georgia	1994	n.a.	n.a.	0,3814	n.a.
Georgia	1995	n.a.	n.a.	0,3814	n.a.
Georgia	1996	n.a.	n.a.	0,840709267	44,10
Georgia	1997	0,822173077	0,03925817	0,840709267	46,50

Georgia	1998	0,705336023	0,054607869	0,840709267	47,90
Georgia	1999	0,162069931	0,071337823	0,840709267	52,50
Georgia	2000	1,760102289	0,052321015	0,840709267	54,30
Georgia	2001	3,008269372	0,03550081	0,845389499	58,30
Georgia	2002	1,230477019	0,043542034	0,845389499	56,70
Georgia	2003	1,161875063	0,042992092	0,845389499	58,60
Georgia	2004	1,497027854	0,054173397	0,845389499	58,90
Georgia	2005	1,125882062	0,049004618	0,845389499	57,10
Georgia	2006	0,71844335	0,059294248	0,842471089	64,50
Georgia	2007	0,773582495	0,0674775	0,846367894	69,30
Georgia	2008	0,422299608	0,053260213	0,962609867	69,20
Georgia	2009	0,439436273	n.a.	0,962609867	69,80
Georgia	2010	n.a.	n.a.	0,962609867	70,40
Kazakhstan	1992	n.a.	n.a.	0,772592154	n.a.
Kazakhstan	1993	n.a.	n.a.	0,772592154	n.a.
Kazakhstan	1994	n.a.	n.a.	0,772592154	n.a.
Kazakhstan	1995	0,008238846	-0,006926744	0,772592154	n.a.
Kazakhstan	1996	0,098856531	-0,057504624	0,78311773	n.a.
Kazakhstan	1997	0,095462758	-0,087966057	0,78311773	n.a.
Kazakhstan	1998	-0,1515271	-0,080224907	0,78311773	41,70
Kazakhstan	1999	1,224381593	-0,087162338	0,78311773	47,30
Kazakhstan	2000	2,198265192	-0,102999638	0,78311773	50,40
Kazakhstan	2001	0,868247557	-0,093055502	0,81319771	51,80
Kazakhstan	2002	1,278827837	-0,109126224	0,81319771	52,40
Kazakhstan	2003	1,710650733	-0,163618649	0,81319771	52,30
Kazakhstan	2004	1,762866858	-0,247110374	0,81319771	49,70
Kazakhstan	2005	1,237135421	-0,33664121	0,81319771	53,90
Kazakhstan	2006	1,001277425	-0,453815528	0,815048294	60,20
Kazakhstan	2007	0,812329132	-0,576917996	0,815031319	59,60
Kazakhstan	2008	0,030704417	-0,046301676	0,82564111	61,10
Kazakhstan	2009	0,367228033	n.a.	0,82564111	60,10
Kazakhstan	2010	n.a.	n.a.	0,82564111	61,00
Kyrgyz Rep,	1992	n.a.	n.a.	0,341783333	n.a.
Kyrgyz Rep,	1993	n.a.	n.a.	0,341783333	n.a.
Kyrgyz Rep,	1994	n.a.	-0,007028368	0,341783333	n.a.
Kyrgyz Rep,	1995	n.a.	-0,004495848	0,341783333	n.a.
Kyrgyz Rep,	1996	n.a.	-0,022608465	0,799321288	n.a.
Kyrgyz Rep,	1997	0,839044838	-0,023593482	0,799321288	n.a.
Kyrgyz Rep,	1998	0,223014554	-0,003670158	0,799321288	51,80
Kyrgyz Rep,	1999	2,555678022	-0,06446662	0,799321288	54,80
Kyrgyz Rep,	2000	1,729317641	-0,082183925	0,799321288	55,70
Kyrgyz Rep,	2001	2,45016362	-0,094077963	0,810162347	53,70
Kyrgyz Rep,	2002	18,40729144	-0,043455138	0,810162347	51,70

Kyrgyz Rep,	2003	24,75301179	0,041879438	0,810162347	56,80
Kyrgyz Rep,	2004	15,86422871	0,177217976	0,810162347	58,00
Kyrgyz Rep,	2005	8,134522034	0,321452769	0,810162347	56,60
Kyrgyz Rep,	2006	0,912492941	0,053105323	0,812535307	61,00
Kyrgyz Rep,	2007	8,190787978	0,647049821	0,814017342	60,20
Kyrgyz Rep,	2008	n.a.	1,224202643	0,817375675	61,10
Kyrgyz Rep,	2009	n.a.	n.a.	0,817375675	61,80
Kyrgyz Rep,	2010	n.a.	n.a.	0,817375675	61,30
Latvia	1992	n.a.	-3,99827E-05	0,804617945	n.a.
Latvia	1993	n.a.	-6,53906E-05	0,804617945	n.a.
Latvia	1994	n.a.	-0,000312837	0,804617945	n.a.
Latvia	1995	0,03936161	-0,000178553	0,804617945	n.a.
Latvia	1996	0,018750893	0,00567841	0,843387264	55,00
Latvia	1997	0,394032995	0,005897295	0,843387264	62,40
Latvia	1998	0,398690873	0,00571602	0,843387264	63,40
Latvia	1999	0,325012199	0,005399921	0,843387264	64,20
Latvia	2000	0,959565721	0,009196064	0,843387264	63,40
Latvia	2001	1,113307245	0,012820125	0,87055939	66,40
Latvia	2002	1,037772024	0,014795885	0,87055939	65,00
Latvia	2003	0,870215816	0,016077002	0,87055939	66,00
Latvia	2004	0,502294113	0,018424058	0,87055939	67,40
Latvia	2005	0,40081916	0,028941546	0,87055939	66,30
Latvia	2006	0,415095164	0,032324312	0,871693025	66,90
Latvia	2007	0,21485373	0,029981052	0,874068025	67,90
Latvia	2008	0,031712748	0,03198761	0,891430544	68,30
Latvia	2009	n.a.	0,045291097	0,891430544	66,60
Latvia	2010	n.a.	n.a.	0,891430544	66,20
Lithuania	1992	n.a.	n.a.	0,821990244	n.a.
Lithuania	1993	n.a.	-5,94943E-06	0,821990244	n.a.
Lithuania	1994	n.a.	1,6354E-05	0,821990244	n.a.
Lithuania	1995	0,08738984	1,38469E-05	0,821990244	n.a.
Lithuania	1996	0,03057706	-0,003164475	0,860881633	49,70
Lithuania	1997	0,176786606	-0,005277353	0,860881633	57,30
Lithuania	1998	0,297943975	-0,005327313	0,860881633	59,40
Lithuania	1999	0,592893641	-0,003940583	0,860881633	61,50
Lithuania	2000	1,178940559	0,001033474	0,860881633	61,90
Lithuania	2001	1,329264935	0,004074317	0,875031328	65,50
Lithuania	2002	2,638804839	0,005495634	0,875031328	66,10
Lithuania	2003	1,379259153	0,004673273	0,875031328	69,70
Lithuania	2004	0,113226743	0,013397598	0,875031328	72,40
Lithuania	2005	0,698595288	0,02029521	0,875031328	70,50
Lithuania	2006	0,353215896	0,021788935	0,873821932	71,80
Lithuania	2007	0,15666886	0,027719033	0,873788598	71,50

Lithuania	2008	0,054000505	0,024589887	0,886738187	70,90
Lithuania	2009	n.a.	n.a.	0,886738187	70,00
Lithuania	2010	n.a.	n.a.	0,886738187	70,30
Moldova	1992	n.a.	n.a.	0,789249872	n.a.
Moldova	1993	n.a.	n.a.	0,789249872	n.a.
Moldova	1994	n.a.	n.a.	0,789249872	n.a.
Moldova	1995	n.a.	0,000201201	0,789249872	33,00
Moldova	1996	1,073361313	0,061831663	0,795705423	52,50
Moldova	1997	1,326930239	0,070222626	0,795705423	48,90
Moldova	1998	0,859786383	0,093171631	0,795705423	53,50
Moldova	1999	0,002428055	0,023514125	0,795705423	56,10
Moldova	2000	2,637545502	0,28853609	0,795705423	59,60
Moldova	2001	5,30335117	0,391848002	0,80619073	54,90
Moldova	2002	10,95238584	0,554518308	0,80619073	57,40
Moldova	2003	9,468846828	0,838273649	0,80619073	60,00
Moldova	2004	4,634384421	1,05046146	0,80619073	57,10
Moldova	2005	4,637005256	1,333926087	0,80619073	57,40
Moldova	2006	3,678552384	1,706824979	0,809216379	58,00
Moldova	2007	3,539348358	1,973023794	0,810384013	58,70
Moldova	2008	0,331612426	0,264942414	0,815667548	57,90
Moldova	2009	-36,10241774	n.a.	0,815667548	54,90
Moldova	2010	n.a.	n.a.	0,815667548	53,70
Mongolia	1992	n.a.	n.a.	0,312091667	n.a.
Mongolia	1993	n.a.	n.a.	0,312091667	n.a.
Mongolia	1994	n.a.	n.a.	0,312091667	n.a.
Mongolia	1995	n.a.	n.a.	0,312091667	47,80
Mongolia	1996	n.a.	n.a.	0,758521591	47,40
Mongolia	1997	n.a.	n.a.	0,758521591	52,90
Mongolia	1998	n.a.	0,000109073	0,758521591	57,30
Mongolia	1999	n.a.	0,000242912	0,758521591	58,60
Mongolia	2000	n.a.	0,000762434	0,758521591	58,50
Mongolia	2001	n.a.	0,002364399	0,792167188	56,00
Mongolia	2002	n.a.	0,002165677	0,792167188	56,70
Mongolia	2003	13,58623375	0,036363541	0,792167188	57,70
Mongolia	2004	2,776189848	0,073406839	0,792167188	56,50
Mongolia	2005	0,117169995	0,006429725	0,792167188	59,70
Mongolia	2006	1,865949808	0,041586667	0,796732357	62,40
Mongolia	2007	0,230239168	n.a.	0,799719511	60,30
Mongolia	2008	0,965909629	n.a.	0,921626472	63,60
Mongolia	2009	0,819134271	n.a.	0,921626472	62,80
Mongolia	2010	n.a.	n.a.	0,921626472	60,00
Russia	1992	n.a.	n.a.	0,796692676	n.a.

Russia	1993	n.a.	n.a.	0,796692676	n.a.
Russia	1994	n.a.	7,95059E-05	0,796692676	n.a.
Russia	1995	0,000126041	-0,000284113	0,796692676	51,10
Russia	1996	0,000137292	-0,000292458	0,3336	51,60
Russia	1997	0,00033045	-0,000317189	0,3336	48,60
Russia	1998	0,000758482	-0,000286773	0,3336	52,80
Russia	1999	0,001097993	-0,000128848	0,3336	54,50
Russia	2000	0,001946453	0,00019821	0,3336	51,80
Russia	2001	0,00249336	-0,000467483	0,80341198	49,80
Russia	2002	0,002186102	-0,001074868	0,80341198	48,70
Russia	2003	0,000310458	-0,000223196	0,80341198	50,80
Russia	2004	0,002704568	-0,002458894	0,80341198	52,80
Russia	2005	0,002515999	-0,003366838	0,80341198	51,30
Russia	2006	0,002651534	-0,00611041	0,806660318	52,40
Russia	2007	0,002978917	-0,008548026	0,809768651	52,20
Russia	2008	0,001790288	-0,012115765	0,813037645	49,80
Russia	2009	0,001019123	n.a.	0,813037645	50,80
Russia	2010	n.a.	n.a.	0,813037645	50,30
Tajikistan	1992	n.a.	n.a.	0,75162662	n.a.
Tajikistan	1993	n.a.	n.a.	0,75162662	n.a.
Tajikistan	1994	n.a.	n.a.	0,75162662	n.a.
Tajikistan	1995	n.a.	n.a.	0,75162662	n.a.
Tajikistan	1996	n.a.	n.a.	0,763733017	n.a.
Tajikistan	1997	n.a.	n.a.	0,763733017	n.a.
Tajikistan	1998	n.a.	n.a.	0,763733017	41,10
Tajikistan	1999	n.a.	n.a.	0,763733017	41,20
Tajikistan	2000	n.a.	n.a.	0,763733017	44,80
Tajikistan	2001	n.a.	n.a.	0,786364657	46,80
Tajikistan	2002	n.a.	2,002212922	0,786364657	47,30
Tajikistan	2003	n.a.	2,977980816	0,786364657	46,50
Tajikistan	2004	n.a.	3,631014019	0,786364657	48,70
Tajikistan	2005	n.a.	8,555517397	0,786364657	50,40
Tajikistan	2006	n.a.	16,46212682	0,790145486	52,60
Tajikistan	2007	n.a.	38,70909481	0,793503897	53,60
Tajikistan	2008	n.a.	55,59289352	0,803973216	54,40
Tajikistan	2009	n.a.	n.a.	0,803973216	54,60
Tajikistan	2010	n.a.	n.a.	0,803973216	53,00
Turkmenistan	1992	n.a.	n.a.	0,317316667	n.a.
Turkmenistan	1993	n.a.	n.a.	0,317316667	n.a.
Turkmenistan	1994	n.a.	n.a.	0,317316667	n.a.
Turkmenistan	1995	n.a.	n.a.	0,317316667	n.a.
Turkmenistan	1996	n.a.	-1,428005901	0,3243	n.a.
Turkmenistan	1997	n.a.	-3,183906392	0,3243	n.a.

Turkmenistan	1998	n.a.	n.a.	0,3243	35,00
Turkmenistan	1999	n.a.	n.a.	0,3243	36,10
Turkmenistan	2000	n.a.	n.a.	0,3243	37,60
Turkmenistan	2001	n.a.	n.a.	0,3281	41,80
Turkmenistan	2002	n.a.	n.a.	0,3281	43,20
Turkmenistan	2003	n.a.	n.a.	0,3281	51,30
Turkmenistan	2004	n.a.	n.a.	0,3281	50,70
Turkmenistan	2005	n.a.	n.a.	0,3281	47,60
Turkmenistan	2006	n.a.	n.a.	0,782510917	43,80
Turkmenistan	2007	n.a.	n.a.	0,783515033	43,00
Turkmenistan	2008	n.a.	n.a.	0,900064625	43,40
Turkmenistan	2009	n.a.	n.a.	0,900064625	44,20
Turkmenistan	2010	n.a.	n.a.	0,900064625	42,50
Ukraine	1992	n.a.	n.a.	0,356983333	n.a.
Ukraine	1993	n.a.	n.a.	0,356983333	n.a.
Ukraine	1994	0,000434752	n.a.	0,356983333	n.a.
Ukraine	1995	0,00206188	n.a.	0,356983333	39,90
Ukraine	1996	0,002242747	3,01477E-05	0,825465985	40,60
Ukraine	1997	0,008112042	5,0597E-05	0,825465985	43,50
Ukraine	1998	0,017956491	7,63853E-05	0,825465985	40,40
Ukraine	1999	0,027942323	0,000215358	0,825465985	43,70
Ukraine	2000	0,030070357	0,000410655	0,825465985	47,80
Ukraine	2001	0,041744203	0,002195941	0,833880515	48,50
Ukraine	2002	0,44698522	0,002952166	0,833880515	48,20
Ukraine	2003	0,445703863	0,00418525	0,833880515	51,10
Ukraine	2004	0,07718386	0,004838431	0,833880515	53,70
Ukraine	2005	0,043700174	0,006489322	0,833880515	55,80
Ukraine	2006	0,045397691	0,009254177	0,836763922	54,40
Ukraine	2007	0,042193152	0,047930049	0,839787131	51,50
Ukraine	2008	0,026376399	0,057554325	0,96048808	51,00
Ukraine	2009	0,007468826	n.a.	0,96048808	48,80
Ukraine	2010	n.a.	n.a.	0,96048808	46,40
Uzbekistan	1992	n.a.	n.a.	0,344983333	n.a.
Uzbekistan	1993	n.a.	n.a.	0,344983333	n.a.
Uzbekistan	1994	n.a.	n.a.	0,344983333	n.a.
Uzbekistan	1995	n.a.	n.a.	0,344983333	n.a.
Uzbekistan	1996	n.a.	n.a.	0,792106941	n.a.
Uzbekistan	1997	n.a.	n.a.	0,792106941	n.a.
Uzbekistan	1998	n.a.	n.a.	0,792106941	31,50
Uzbekistan	1999	n.a.	n.a.	0,792106941	33,80
Uzbekistan	2000	n.a.	n.a.	0,792106941	38,10
Uzbekistan	2001	n.a.	n.a.	0,799846291	38,20
Uzbekistan	2002	n.a.	n.a.	0,799846291	38,50

Uzbekistan	2003	n.a.	n.a.	0,799846291	38,30
Uzbekistan	2004	n.a.	n.a.	0,799846291	39,10
Uzbekistan	2005	n.a.	n.a.	0,799846291	45,80
Uzbekistan	2006	n.a.	n.a.	0,799181662	48,70
Uzbekistan	2007	n.a.	n.a.	0,799396136	51,50
Uzbekistan	2008	n.a.	n.a.	0,912999337	51,90
Uzbekistan	2009	n.a.	n.a.	0,912999337	50,50
Uzbekistan	2010	n.a.	n.a.	0,912999337	47,50